

REP ID: _____

MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION

REF ID: 71114

JOB PROGRESS REPORT

State Montana

Project No. F-4-R-18 Title Statewide Creel Census and Statistical Services

Job No. I Title Statewide Creel Census

Period Covered July 1, 1968 through June 30, 1969

ABSTRACT

A mail fishing pressure survey was conducted year around. The statewide pressure by licensed fishermen for the year May 1, 1968 through April 30, 1969 was estimated to be 2,166,695 fisherman days. Eighty-one percent of this occurred from May through September and 88 percent of the total pressure was by resident fishermen.

Fishing pressure estimates were made for 1,433 individual waters during the period May 1 through September 1968 and for 302 waters during the period October 1, 1968 through April 1969.

Fisherman Logs furnished statewide creel data. Information was obtained from 367 anglers. A total of 5,760 fishing trips were reported with a catch of 32,976 fish, exclusive of coarse fish. Average catch per hour during the winter was 1.6 game and sport fish and the average summer catch was 1.5.

BACKGROUND

Fishing Pressure Survey

Individual states have long felt the need for reliable estimates of statewide fishing pressure and estimates of the pressure on individual bodies of water. In 1958, '59, and '60 a postal survey involving waves of questionnaires was used in Montana (Project F-4-R-8, Job III; F-4-R-9, Job III; F-4-R-10, Job III) to determine statewide fishing pressure and catch during the main fishing season and to apportion pressure and catch by drainage and county. Pressure and catch were also apportioned on a statewide basis by water type (trout streams, trout lakes, nontrout streams, nontrout lakes, etc.). The approach used was one suggested by Dr. Edward C. Bryant, who was then head of the University of Wyoming Statistic Department, and since used and modified by the Wyoming Game and Fish Commission.

Data from these surveys on catch rate and composition of the catch were deemed inaccurate after comparison with information from on-site creel censuses. Therefore, later surveys were designed to obtain information on fishing pressure only.

In 1960 the late Thomas H. Leik, who was statistician for the Montana Fish and Game Department, and Dr. Hans Hamann, a statistician at Montana State University, worked to refine the basic survey techniques. These refinements provided estimates of fishing pressure on individual waters, the placing of confidence limits on these estimates, and the compilation of the data by electronic computer.

A survey conducted in 1965 from the fourth Sunday in May (opening of the general fishing season) through September is considered to have yielded usable data. Sampling problems were encountered in a survey covering the same period of 1966 and the results were deemed unusable.

A wave survey was not conducted in 1967. In 1968 the survey was started on May 1 and has operated since on a year-round basis.

Fisherman Logs

The Fisherman Log program was initiated about 1950. It provides trend information on rate of catch and species and size composition of fish caught from individual waters. Fishermen who keep logs are on the whole more skilled than the average Montana fishermen, so data they provide does not represent the average. Nevertheless, Fisherman Log information is quite valuable for determining trends on individual waters, and for making comparisons of fishing success from water to water.

OBJECTIVE

The objective of this project is to provide fisheries managers (1) information on fishing pressure on individual waters through means of a mail survey; and (2) information on rate of catch and composition of catch from Fisherman Logs.

PROCEDURES

Fishing Pressure Survey

During this report period, three categories of licensed Montana fishermen were sampled: resident, 6-day nonresident, and seasonal nonresident. Throughout the year periodic waves of questionnaires were sent to a sample of each. Questionnaires asked for fishing information on a comparatively small portion of the fishing season. This was done since fishermen can more accurately account for a short period of their fishing time than for an entire season.

At the end of the license year questionnaires covering the entire year were also sent to a sample of \$150 nonresident license holders. Due to an oversight, data from these were not included in the tabulation of statewide fishing pressure. There were several categories of resident licenses, i.e., they were sold in combination with various hunting licenses. All of these categories were sampled proportionally except the Sportsman's License. As only 427 of these were sold, this category was not sampled.

When the questionnaire covered a two-week period, a double postcard was used (Figures 1, 2 and 3). A letter questionnaire was used for other periods (Figures 4, 5 and 6). Nonrespondents were sent one follow-up questionnaire. All nonresident names were drawn from the current year's license list. Resident names for the first five waves (covering the period May 1 through July 9) were from the previous year's license list. Subsequent waves to residents were from the current year licenses.

The questionnaires asked the fishermen to record the number of days fished during a specified period. This gave information throughout the fishing season for each type of license holder. The average number of days fished was computed for each category of angler for each period which ranged from two weeks for the resident angler to a one-month period for the seasonal nonresident license holder. This was expanded by the number of that type license available for use during the period, and in turn gave an estimate of the total fishing pressure during the period by holders of that category of license. The sum of estimates for the individual periods gave the total fishing pressure exerted by the given category of license holder. Combining the totals for each of the three categories gave the estimate of total fishing pressure in Montana by all types of licensed fishermen.

The estimated pressure for any one body of water was derived by determining the ratio of the trips reported on that water to the total trips in Montana during the season and applying this ratio to the total season's estimated pressure for Montana. This was done for each license category individually and these estimates were summed. It is possible to combine pressures for any one body of water for several fishing seasons. In the case of waters for which there are very few returns, an annual pressure estimate based on several years returns is considered more realistic than an estimate based on a single year's returns.

Electronic data processing procedures greatly facilitated the survey. Names and addresses of licensees to be sampled were punched on electronic data processing cards and address labels were prepared by a computer for postcards. In the case of letter questionnaires the name, address and purchase date of the license were printed by computer on the back of the questionnaire. The names and addresses were spaced so window envelopes could be used. A major human effort in processing the returned questionnaires is entering code numbers from our master lake and stream file to each water reported as having been fished. After coding, data from returned questionnaires was punched onto cards and compiled by means of a computer program.

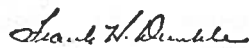
STATE OF MONTANA — SPORT FISHING SURVEY

We need help in gathering fishing information on Montana's lakes and streams. You are one of a small group of representative fishermen we are contacting. Please let us know where you went fishing **during the past two weeks.**

This is not a survey to determine how many or what kind of fish you caught. So, **even if you did not fish, did not catch any fish,** or released the ones you caught, please fill out and return the attached card.

Thank you.

Sincerely,



FRANK H. DUNKLE, DIRECTOR
MONTANA FISH AND GAME DEPARTMENT

STATE OF MONTANA



DEPARTMENT OF FISH AND GAME
HELENA, MONTANA 59601



First Class
Permit No. 112
Sec. 34.9, P.L. & R.
Helena, Montana

BUSINESS REPLY MAIL

No Postage Stamp Necessary If Mailed in the United States

—POSTAGE WILL BE PAID BY—

**FISH AND GAME DEPARTMENT
HELENA, MONTANA 59601**

Nº 1325 1



Figure 1. Message side of double postcard mailed to resident anglers in two-week waves from May through September 1968.

STATE OF MONTANA



DEPARTMENT OF FISH AND GAME
HELENA, MONTANA 59601

1325 JAMES SPORTSMAN
722 31st AVE.
ANYTOWN, MT.

Your name has been chosen from a list of 1967 license holders.

- * 1. Did you buy a license to fish this year? Yes ☐ No ☐
 * 2. Did you fish on any of the days listed below? Yes ☐ No ☐
 3. If yes, for each day fished please list the places you fished and the nearest town.

DAY 1968	NAME OF LAKE OR STREAM FISHED	NEAREST TOWN OR COUNTY	Do not Write
Wed. May 1			
Thur. May 2			
Fri. May 3			
Sat. May 4			
Sun. May 5			
Mon. May 6			
Tues. May 7			
Wed. May 8			
Thur. May 9			
Fri. May 10			
Sat. May 11			
Sun. May 12			
Mon. May 13			
Tues. May 14			

No 1325 1 *Starting with 6th wave (July 10) questionnaires
 were sent only to holders of current licenses.
 Therefore, these two lines were omitted.

Figure 2. Return portion of double postcard.

STATE OF MONTANA — SPORT FISHING SURVEY

We recently mailed you a request for information on your fishing in Montana. If you haven't mailed your reply, please take a few minutes to fill out and return the attached card.

It is important to RETURN THE QUESTIONNAIRE WHETHER YOU FISHED OR NOT.

If you have already mailed the questionnaire, please accept our thanks and disregard this reminder.

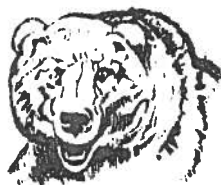
Your help will be appreciated.

Sincerely,



FRANK H. DUNKLE, DIRECTOR
MONTANA FISH AND GAME DEPARTMENT

Figure 3. Example of message used on follow-ups. One follow-up was sent to each person who did not return original questionnaire. Each follow-up included a questionnaire form.



MONTANA FISH AND GAME DEPARTMENT

HELENA, MONTANA 59601

SPORT FISHING SURVEY

Dear Fisherman:

We need help in gathering fishing information on Montana's lakes and streams. You are one of a small group of representative fishermen we are contacting. Please let us know where you went fishing during February.

This is not a survey to determine how many or what kind of fish you caught. So, even if you did not fish, did not catch any fish or released the ones you caught, please fill out and return this questionnaire. Also include days spent snagging or using other methods to catch fish when provided in fishing regulations.

Thank you,

MONTANA FISH AND GAME DEPARTMENT

Did you fish on any of the days listed below? YES ☐ NO ☐

If yes, for each day fished please list the places you fished and the nearest town.

FEBRUARY 1969		
DATE FISHED	NAME OF LAKE OR STREAM FISHED	NEAREST TOWN OR COUNTY
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11	EDWARD M. FISHERMAN	(Address was positioned
12	1234 FAIRWAY AVE.	on back of letter ques-
13	SOMETOWN, MT.	tionnaires so it could
14		be seen in window en-
15		velope.)
16		00351
17		05 10 68
18		(Date license
19		purchased)
20		
21		
22		
23		
24		
25		
26		
27		
28		



I did not fish ☐

[illegible]



MONTANA FISH AND GAME DEPARTMENT

HELENA, MONTANA 59601

SPORT FISHING SURVEY

Dear Fisherman:

Our records show you purchased a Montana nonresident season fishing license on the date printed on the back of this page. We would like your assistance in gathering information on Montana's lakes and streams. Please let us know where you went fishing in Montana during February 1969.

This is not a survey to determine how many or what kind of fish you caught. So, even if you didn't catch any fish or released the ones you caught, please fill out and return this questionnaire. Also include days spent snagging or using other methods to catch fish when provided by the fishing regulations.

Thank you,

MONTANA FISH AND GAME DEPARTMENT

I did not fish in Montana during February 1969 ☐

FEBRUARY 1969		
DATE FISHED	NAME OF LAKE OR STREAM FISHED	NEAREST CITY OR COUNTY
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
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26		
27		
28		

Please do not use this form for correspondence

Figure 6. Questionnaire mailed to nonresident seasonal fishing license holders.

Fisherman Logs

Pocket-sized Fisherman Logs were distributed to cooperating sportsmen. At the end of the fishing season, a letter was sent to the log holders asking them to return the booklets to the Fish and Game Department. Records were transcribed from the logs and the logs were returned to their owners.

The following information was tabulated for each lake and stream from which log data were received: (a) Number of fishermen; (b) Hours fished; (c) Catch per hour; (d) Number of each species of fish; (e) Average length of each species of fish; and (f) Percentage species composition.

FINDINGS

Fishing Pressure Survey

The statewide pressure by licensed fishermen for the year May 1, 1968 through April 30, 1969 was estimated to be 2,166,695 fisherman days. Eighty-one percent of this occurred from May through September and 88 percent of the total pressure was by resident fishermen.

Fishing pressure estimates were made for 1,433 individual waters during the period May 1 through September 1968 and for 302 waters during the period October 1, 1968 to April 30, 1969. A specimen of the printout is given in Figure 7.

Tallies of the numbers of questionnaires mailed out and returned are presented in Tables 1 through 3. During the 12-month period 73 percent of the questionnaires sent to residents, 83 percent of those sent to nonresident 6-day licensees, and 84 percent of those sent to nonresident season licensees were filled out and returned. In computing these percentages the number of "questionnaires sent" was the number (originals only) mailed less those returned by the Post Office (originals and follow-ups^{1/}). Follow-up questionnaires returned were counted the same as originals returned.

Fisherman Logs

The Fisherman Log census this year was divided into a winter season: December 1, 1967 through April 30, 1968 and a summer season: May 1, 1968 through September 30, 1968.

Three hundred sixty-seven Fisherman Logs were returned to the Fish and Game Department. These represented 1,028 fishing trips and 3,988 hours of fishing during the winter season. On these trips anglers took 6,357 fish,

^{1/} The number of duplicate originals and follow-ups returned from Post Office is believed to be minimal. Counts for future reports will eliminate duplicates.

FISHING PRESSURE ESTIMATE
MAY 1968 - SEPT 1968
ALL LICENSE TYPES

WATER CODE	WATER NAME	DIST	80% CONFIDENCE INTERVAL		
			LOW	PT EST	HIGH
	STATEWIDE RESIDENT PRESSURE		1480689.	1519126.	1557562.
	STATEWIDE NONRES. 6DAY PRESSURE		159762.	161772.	163782.
	STATEWIDE NONRES. SEAS. PRESSURE		66196.	69653.	73110.
	STATEWIDE TOTAL PRESSURE		1711907.	1750551.	1789194.
211500 8	ABANDONED PIT LAKE	7	-32.	208.	447.
164300 5	ACKLEY LAKE	4	4182.	5440.	6699.
8798020	AENEAS LAKE	1	-3.	12.	28.
27150 3	AJAX LAKE	3	-3.	12.	28.
180060 1	ALABAUGH CREEK	4	4.	44.	84.
108200 3	ALBRO LAKE	3	157.	569.	982.
10020 1	ALDER CREEK	3	-3.	12.	28.
10040 1	ALDER GULCH CREEK	3	227.	571.	915.
40030 1	ALICE CREEK	2	374.	852.	1330.
07315 3	ALPINE LAKE	2	-3.	12.	28.
117840 3	ALVORD LAKE	1	-3.	12.	28.
180120 1	AMERICAN FORK CREEK	5	59.	396.	733.
30100 1	ANDREWS CREEK	2	-3.	12.	28.
137440 3	ANTELOPE BASIN LAKE	3	-3.	12.	28.
160120 1	ARMELLS CREEK	4	-52.	186.	424.
220140 1	ARMSTRONGS SPRING	3	72.	121.	170.
40150 1	ARRASTRA CREEK	2	-6.	234.	474.
160140 1	ARROW CREEK	4	268.	743.	1219.
70140 1	ASHLEY CREEK	1	1406.	2230.	3053.
75220 3	ASHLEY LAKE	1	1909.	2801.	3693.
170160 1	AVALANCHE CREEK	3	592.	1175.	1759.
107815 5	B R #48 RESERVOIR	6	-52.	186.	424.
90114 1	BACON RIND CREEK	3	44.	85.	126.
140200 1	BADGER CREEK	4	367.	846.	1325.
104340 6	BAHLS DAM-BERNIE	6	-52.	186.	424.
90152 1	BAKER CREEK	3	1019.	1733.	2447.
227203 3	BALD KNOB LAKE	5	-32.	208.	447.
60285 1	BARKER CREEK	2	-3.	12.	28.
110200 1	BARRON CREEK	1	-52.	186.	424.
100160 1	BASIN CREEK	3	-52.	186.	424.
227224 3	BASIN CREEK LAKE UPPER	5	-52.	186.	424.
100120 1	EASIN CREEK	3	17.	48.	79.
00480 1	BASIN CREEK	1	-3.	12.	28.
00500 1	BASIN CREEK	1	-3.	12.	28.
30200 1	BASS CREEK	2	169.	582.	994.
37250 3	BASS LAKE	2	-52.	186.	424.
170272 1	BATTLE CREEK	4	-17.	222.	461.
170720 5	BEAN LAKE	4	6972.	8565.	10157.
110280 1	BEAR CREEK	1	397.	929.	1461.
70200 1	BEAR CREEK	1	35.	372.	708.
220350 1	BEAR CREEK	3	35.	372.	708.
30250 1	BEAR CREEK	2	-6.	234.	474.
00540 1	BEAR CREEK	1	-52.	186.	424.
130400 1	BEAR CREEK	3	2.	24.	46.
6039910	BEAR CREEK	2	-3.	12.	28.

PAGE 1

PAGE 1

Figure 7. Page 1 of printout for fishing pressure estimates for summer 1968.

Table 2. Tally of questionnaires mailed to and returned by resident fishermen.

ORIGINALS

FOLLOW-UPS

Wave No.	No. mailed	Date mailed	Unusables		Bought license ^{1/}	Fished during period	No. mailed	Date mailed	Unusables		Bought license	Fished during period
			Ret'd by PO	Other	Yes				Ret'd by PO	Other	Yes	
		1968						1968				
1	1000	5-13	33	5	248	117	584	5-22	18	1	73	23
2	1000	5-27	46	9	249	176	2/	6-07	12	2	77	34
3	1000	6-10	42	4	265	169	581	6-27	15	1	86	42
4	1000	6-24	54	8	290	175	592	7-10	14	2	98	39
5	1000	7-08	36	6	340	248	620	7-22	15	1	111	68
6	1000	7-23	15		470	244	608	8-12	5		176	63
7	1000	8-05	13		507	250	548	8-12	10		160	60
8	1000	8-19	15		496	226	574	9-03	4		195	58
9	1000	9-03	20		482	214	625	9-13	14		183	53
10	1000	9-16	22	1	496	157	597	9-25	10		174	32
11	1000	9-30	19		529	126	580	10-10	3		176	30
12	1000	10-29	31		505	129	485	12-03	5		205	53
								1969				
13	1000	12-03	40		521	54	479	1-03	7		241	24
		1969										
14	1000	1-02	36		583	40	432	1-28	8		217	21
15	1000	2-04	38		583	47	401	3-04	8		299	16
16	1000	3-06	39		588	67	415	3-26	3		205	17
17	1000	4-01	30		570	91	488	4-23	8		214	19
18	1000	4-30	44		542	95	445	5-27	11		198	27
TOTALS	18000		573	33	8264	2625			170	7	3088	679

^{1/} Waves 1 through 5 were sent to persons who purchased license during the previous license year (1967-8).
 Subsequent waves were sent to holders of current licenses.

^{2/} Not recorded

Table 4. Species composition of harvest reported in Fisherman Logs.

WINTER SEASON December 1, 1967 - April 30, 1968		SUMMER SEASON May 1, 1968 - September 30, 1968	
<u>6,357 game and sport fish</u>		<u>26,619 game and sport fish</u>	
<u>Species</u>	<u>Percent</u>	<u>Species</u>	<u>Percent</u>
Rainbow trout	42.0	Rainbow trout	45.2
Whitefish	31.0	Brook trout	14.8
Brown trout	11.6	Cutthroat trout	11.9
Cutthroat trout	4.2	Brown trout	11.2
Brook trout	3.3	Whitefish	2.9
Yellow perch	3.1	Yellow perch	2.8
Kokanee	1.3	Largemouth bass	2.2
Sauger and walleye	1.0	Sunfish	2.0
Largemouth bass	.5	Bullheads	1.6
Burbot	.5	Kokanee	1.1
Dolly Varden	.3	Sauger and walleye	.7
Lake trout	.3	Northern pike	.7
Coho salmon, golden		Arctic grayling	.6
trout and Arctic grayling	.3	Dolly Varden	.5
Northern pike	.3	Crappie	.5
Bullhead and goldeye	.3	Goldeye	.4
		Lake trout	.3
		Coho salmon	.2
		Channel catfish	.2
		Paddlefish, sturgeon	
		and burbot	.1
		Golden trout	*
		Smallmouth bass	*
<u>60 other fish</u>		<u>454 other fish</u>	
<u>Species</u>	<u>Percent</u>	<u>Species</u>	<u>Percent</u>
Sucker	55.0	Sucker	47.6
Northern squawfish	30.0	Northern squawfish	32.6
Peamouth	15.0	Carp	8.6
		Peamouth	5.7
		Sculpin	2.6
		Freshwater drum	2.2
		Golden shiner and	
		stonecat	.7

* Less than 0.05%

exclusive of coarse fish, for an average catch of 1.6 fish per man-hour and 6.2 per trip. During the summer period, 4,732 fishing trips and 17,796 hours produced 26,619 fish for an average catch of 1.5 per man-hour and 5.6 per man-day. The species composition of the catch recorded on logs is presented in Table 4.

The information tabulated for individual waters (165 for the winter period, 704 for the summer period) will be distributed to the respective project leaders for inclusion in their lake and stream survey files. It will also be stored on magnetic tape in the Central Data Processing Section.

RECOMMENDATIONS

It is recommended the mail fishing pressure survey be conducted annually, at least for the next few years. The data derived from this survey should be evaluated continuously to make sure it warrants our confidence.

It is recommended the Fisherman Log program be continued and that it be expanded when the work load involved in developing the mail fishing pressure survey moderates.

Prepared by George D. Holton

Date June 23, 1970